



# Circulation Chapter

## INTRODUCTION

The Circulation Chapter is concerned with the movement of people and goods through and around the city. The focus is on the system of freeways, local roads, bus and rail transit, and bicycle and pedestrian routes to determine the most effective design possible while enhancing the community and protecting the environment.

State law recognizes that circulation and land use are closely related and requires that policies in the Circulation Chapter and the Community Development Chapter be tied together. The policies should demonstrate a balance between land uses and the transportation facilities that serve them. The circulation policies are also interwoven with economic, housing, open space, air quality, noise, and safety policies.

Three background reports were prepared for this Chapter. They describe the current transportation system, what has been accomplished since the 1982 General Plan, and future trends in transportation. The Environmental Planning Commission's discussion of these reports evolved into several major findings and underlying themes of the Circulation Chapter. They are:

- Traffic is a regional problem. It must be solved through the cooperative efforts of many agencies.
- Land use and transportation are irrevocably connected. They must be carefully balanced as the city and the region continue to evolve.
- Single-passenger autos have strained the regional transportation system to its limits. Much greater emphasis must be placed on alternatives—ridesharing, bus and rail transit, bicycling, and walking.
- The harm that auto use causes to air quality will be a major force behind transportation policies over the next 15 years.
- Rail transit, rather than road projects, should be the major transportation investment of the future.
- Excellent design, generous landscaping, sound walls, and other buffers can enhance transportation facilities and make them an asset to the community.

- Transportation facilities should be designed to serve all members of the community—children, seniors, the handicapped, and those who depend on bus and rail for mobility.

## Accomplishments

Mountain View has made significant strides toward carrying out the policies of the 1982 General Plan, either through City actions or the actions of other agencies. Examples of these accomplishments include:

- Adoption of a model Transportation Demand Management (TDM) ordinance, which gives employers greater responsibility for helping their employees find commute alternatives;
- Addition of "commuter lanes" on U.S. 101 and State Route 85 to encourage higher average vehicle occupancy during commute periods;
- Reconstruction of Castro Street in the Downtown, creating an environment that encourages people to walk and take public transit rather than drive;
- Completion of most of the local street improvements listed in the 1982 Plan;
- Implementation of shuttle service between North Bayshore and Whisman industrial area employers and the CalTrain stations;
- Installation of extensive roadway landscaping on arterial streets and Central Expressway;
- Expansion of the bicycle system from 20 to 40 miles of lanes and routes as recommended by the Bicycle Advisory Committee in 1986;
- Construction of mixed-use and high-density developments that support transit.

## The Transportation Environment in 1991

Transportation is now thought of as primarily a regional problem in the San Francisco Bay Area, a major change in perception since 1981.

The State of California and Santa Clara County have become more involved in transportation improvement projects. Voters have been more willing to approve additional taxes for transportation. Air-quality legislation has become a major force. There is a growing awareness of the significant effect of congestion upon the region's environmental, economic, and social well-being.

Traffic and congestion have been named as the Bay Area's most significant problem for eight years in a row, from 1983 to 1990, by respondents to an annual poll conducted by the Bay Area Council. More respondents list transportation first every year. Forty-six percent of Santa Clara County residents named traffic as the worst problem in the 1990 poll, compared to 38 percent of all Bay Area residents who listed traffic first.

There are reasons for the perception that traffic is a serious problem:

- People are driving more. Vehicle miles of travel, a standard measure of travel demand, and auto registrations have increased much faster than employment or the population.
- Land and housing prices in the region continued to climb. New housing is forced further into outlying areas and people must make longer commute trips.
- There are more employed people per household. Households earn more, own more cars, and make more commute trips. People now run errands, do their shopping, and transport their children at peak hours, rather than during the day.

**Air Quality.** Air pollution is another major regional issue that has been more firmly linked to transportation during the past decade. More than half of the air pollution in California is caused by cars. In the Bay Area, auto exhaust is responsible for 82 percent of carbon monoxide, 70 percent of visible particles, which are called particulates; 52 percent of nitrogen oxide, which causes "brown haze"; and 42 percent of hydrocarbons. Nitrogen oxide and hydrocarbons combine under sunlight to form ozone. Ozone near the ground is harmful to people, plants, and materials. Ozone in the stratosphere is needed to protect people from excessive ultraviolet radiation. The Environmental Management Chapter discusses air quality in more detail.

Strict emission-control standards have improved auto emissions since the 1960s, but air quality will be worse after 2000 because people are driving more. The California Clean Air Act was passed in 1988 to deal with this problem. It established strict new air quality standards and gave Regional Air Quality Districts new powers to achieve them. These powers include developing and car-

rying out Transportation Control Measures (TCMs). TCMs are aimed at curtailing the use of cars through employer-based trip reduction, land-use policies, and special fees tied to vehicle use.

## Regional Transportation Issues

Mountain View recognizes that the growth in traffic is a regional problem closely tied to the pattern of land use that has evolved in the San Francisco Bay Area. Since 1970, job growth has been concentrated in Santa Clara County, particularly in northern Santa Clara County, while new housing for workers has been built in the South County, the East Bay, and more recently in San Joaquin and Merced Counties. By 2005, 18.3 percent of Santa Clara County's commuters will live outside the county, up from 13.6 percent in 1980, according to projections by the Santa Clara County Transportation Agency. At least 40 percent of people working in Mountain View will live outside the city in 2005, compared to 36 percent in 1990.

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**Help reduce regional traffic growth.**

## Regional Transportation Groups

Regional planning is one way of dealing with the traffic congestion and air pollution that have resulted from long-distance commuting. Mountain View is working with many regional agencies. Some of the agencies are:

- *Santa Clara County Transportation Agency.* Prepares and carries out a comprehensive Countywide Transportation Plan, called T2010, and operates bus and Light Rail systems.
- *Congestion Management Agency.* Develops standards for traffic service level, coordinates local land-use planning, and establishes capital improvement programs under a State referendum approved in 1990. This agency replaced the Golden Triangle Task Force, a group of five cities, including Mountain View, and the County, which worked with the Santa Clara County Manufacturing Group between 1985 and 1990 to develop land use policies and employer-based programs to reduce traffic congestion.
- *Santa Clara County Traffic Authority.* Administers the "Measure A" half-cent sales tax for the construction of freeway improvements.
- *Metropolitan Transportation Commission.* Prepares and carries out a Regional Transportation Plan, establishes priorities for federal and State funding, and conducts studies of transportation corridors.

- *The Tasman Corridor Study Policy Board.* Analyzed alternatives for improving transit in the Tasman Corridor, located between Milpitas and the Mountain View/Sunnyvale area. The study led to the decision to extend Light Rail Transit to Mountain View.
- *Peninsula Corridor Joint Powers Board.* Owns and operates the Peninsula commuter train service (CalTrain).

**Policy 1.** Participate actively in regional planning efforts and programs at the Bay Area, County, and subregional level.

**Action 1.a** Continue to provide Council and staff representation on regional transportation planning groups.

**Action 1.b** Work with the Congestion Management Agency to carry out the Congestion Management Plan.

**Policy 2.** Support regional transportation policies, programs, and projects that will limit growth of traffic on freeways, expressways, and local streets.

**Action 2.a** Coordinate local transportation plans and improvements with those of regional agencies.

**Action 2.b** Commit staff resources to the review, analysis, and monitoring of regional transportation plans.

## LAND USE AND TRANSPORTATION

Local land use planning is another method of managing regional traffic growth as well as local traffic problems. This General Plan includes land use policies aimed at giving more Mountain View workers the choice of living closer to their jobs. It also continues policies supporting mixed-use developments and higher-density development near rail stations. These policies can be found in the Community Development and Residential Neighborhoods Chapters. If other cities adopt similar policies, it may also be possible to improve the balance of jobs and housing, which will reduce the length and number of commute trips.



**Coordinate transportation and land use planning.**

## Ensuring Adequate Transportation

The traffic analysis in the "Future Conditions" background report for the Circulation Chapter shows that the roads in Mountain View can accommodate the amount of development projected for 2005. However, specific intersections within the city are at or near capacity. More and wider roads are expensive, hurt the environment, and can diminish positive elements of Mountain View's character. Alternatives to major road improvements are discussed throughout this Chapter. They include Transportation Demand Management, more efficient operation of existing roads, and improvements to the rail, bus, bicycle, and pedestrian circulation systems.

**Policy 3.** Ensure that future development and the transportation system are in balance.

**Monitoring Land Use and Transportation.** The location and intensity of development has an immediate effect on traffic levels in the surrounding area and on the city as a whole. Transportation engineers have developed several mathematical tools to monitor the relationship between land use and the transportation system. One tool is the traffic forecasting model. This model tries to forecast traffic volumes and simulate traffic conditions under future land use scenarios based on estimates of how much traffic will be generated by new development, what streets the traffic will use, and the amount of new traffic the street system can accommodate. The City used a traffic model to develop information for the "Future Conditions" background report.

The General Plan traffic model evaluated the capacity of the "links," that is, the roads, in the transportation system. However, these roads meet at intersections, which can become bottlenecks. Mountain View is instituting a city-wide traffic model that will evaluate the capacity of intersections to accommodate additional traffic. This evaluation can be added to the development review process to help determine types and intensities of land use and suitable mitigation measures.

**Action 3.a** Develop and maintain a city-wide traffic model as a tool to help evaluate the balance between development and transportation.

It will be important for the City to allocate resources to update the land use and transportation data in the traffic model continually if the model is to be useful.

**Development Review.** The California Environmental Quality Act (CEQA) requires cities to assess the environmental effects, including the traffic impacts, of new development. A traffic analysis is required if a project is



large or is expected to produce a lot of new traffic. The Congestion Management Program also requires a traffic analysis for projects over a certain size. When the traffic analysis shows that the development will cause an intersection to drop below desired Levels of Service, the City may require the new development to alleviate its share of the congestion. The costs of specific improvements or traffic reduction programs such as TDM would be shared over time by several developments, and, if appropriate, the City. The types of improvements and programs and the appropriate method of paying for those efforts could be established through area-wide studies, including the General Plan and zoning studies. The appropriate share of the costs for specific developments can be allocated through assessment districts, traffic impact fees, or developer agreements. An alternative to improvements and programs is to reduce the scale of development or phase it until improvements are made.

**Action 3.b** Require a traffic analysis for large new developments and those expected to worsen traffic conditions noticeably.

**Action 3.c** Require developers to lessen their share of the effects that their new developments have on transportation, as a condition of project approval.

**Action 3.d** Consider requiring measures such as street improvements, Transportation Demand Management programs, employer-financed shuttle buses, traffic impact fees, assessment district or other financial commitments, and reduced project size to reduce traffic impacts.

**Level of Service.** Level of Service (LOS) is a term used to describe traffic conditions. LOS can be described both in quantitative terms, for example, how many seconds a driver waits at an intersection, and in qualitative terms, for example, how a driver perceives the waiting experience.

New and upgraded intersections should be designed and built to ensure that they will function at least at a Level of Service D, "tolerable delay," during peak traffic periods. (See Figure 1.) Average waits would be 25-40 seconds, and drivers would begin to notice backups on more than one leg of the intersection.

**Policy 4.** Use peak-hour Level of Service D as the design standard for new or reconstructed streets, intersections, and traffic-control devices on arterials.

**Standards for Special Areas.** Maintaining a Level of Service D at existing intersections is not always appropriate or necessary. People may expect and tolerate varying lev-

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## What Is "Level of Service"?

LOS describes driving conditions or how well traffic is moving. LOS can be expressed as a quantitative measure and as a qualitative experience. The quantitative description focuses on how long drivers may have to wait to get through an intersection or the speed at which they can travel on a street. The qualitative measure focuses on how drivers perceive their driving experience. (See Figure 1.)

Traffic engineers use quantitative measures of LOS to help them design or reconstruct a street or intersection. The engineers take into account the volume of traffic and where it is coming from, the size and design of the arterial or intersection, signal timing, distance between cars, how aggressively people drive, and other variables. Each LOS is assigned a letter, ranging from A, which is less than a five-second wait at intersections and no restrictions on speed along arterials, to F, delays of more than 60 seconds at intersections, and "stop and go" movement on arterials. LOS is normally used to describe peak-hour conditions, the morning or afternoon hour when traffic is heaviest.

The quantitative measure of LOS can be roughly equated with drivers' perception of driving conditions. Drivers may experience LOS A through LOS D as "free-flowing" to "easily understandable delay." Conditions of LOS E and F are usually less acceptable. Perception of traffic conditions is often influenced by expectations. People expect and accept occasionally heavy traffic, but not a continuous network of delays and not throughout the day. They also expect and tolerate more traffic delay in high-activity areas, such as a lively Downtown, than they will accept on neighborhood streets.

Quantitative measures of LOS are useful aids to understanding the community and helping identify potential problems with street design and impacts of land use. However, LOS ranges are theoretical. When used as a factor in determining land use capacity, they must be tempered by judgment and interpretation. Minor adjustments in signal timing, turning-lane provisions, points of access from adjoining property, and other modifications can improve the actual operation of the intersection. Given all the variables, intersections often work better than the LOS would predict. In such cases, more detailed evaluation of driving behavior and intersection design are needed.

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els of congestion depending on location and time of day. For example, in the Downtown and the San Antonio regional commercial area, people expect more traffic. It is perceived as part of the activity and vitality associated with higher densities and a mixture of uses, greater pedestrian activity, and heavier transit use. In these areas, "significant delays" (LOS E) may be acceptable. Allowing for heavy traffic in these few locations takes into con-

sideration how people perceive congestion. While more traffic may be understandable, every effort should be made to encourage people to walk once they arrive.

Other areas where special Level of Service standards are appropriate are the freeways, expressways, and principal arterial streets included in the Congestion Management Agency (CMA) road system. Principal arterials in Mountain View are El Camino Real and San Antonio Road. Under CMA legislation approved in 1990, selected intersections along the principal arterials, freeways, and expressways must be monitored and improved if they drop below LOS E.

Residential neighborhoods are also special areas. However, neighborhood traffic problems usually mean excessive traffic, speeding, and accidents, rather than congestion as measured by LOS. These traffic problems and proposals to respond to them are addressed through the neighborhood traffic management policies discussed later in this Chapter.

- Policy 5. Establish goals for intersection Levels of Service that reflect the special circumstances of the surrounding area.**
- Action 5.a** Use Level of Service D, "acceptable delays," for most arterials and their intersections.
- Action 5.b** Use Level of Service E, "significant delays," for Downtown and San Antonio Center where vitality, activity, and transit use are primary goals.
- Action 5.c** Use Level of Service E, "significant delays," for roads in the Congestion Management Agency street network, in accord with Congestion Management Agency legislation.

## TRANSPORTATION DEMAND MANAGEMENT

Seventy-six percent of Santa Clara County commuters drive to work alone, placing a very heavy commute burden on the county's road system. If this trend continues with no additional transit service and no increase in ridesharing, it will be impossible to build roads wide enough to handle all the cars. Air quality will worsen. Clearly, there has to be a change in the trend.

Transportation Demand Management is one answer to this problem. TDM attempts to reduce the number of people who drive alone during the commute period, and

to increase the number of people who walk to work and who use carpools, vanpools, buses, trains, and bicycles. TDM works best during peak periods because many people are going to and coming from the same directions. This makes it easier to share rides and to supply enough riders to justify express and shuttle buses. The Golden Triangle Task Force concluded that employers can play a major role in carrying out TDM.

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**Increase the number of riders per vehicle during peak commute periods.**

### TDM Ordinance

In 1990, Mountain View became the first city in Santa Clara County to adopt the Golden Triangle's model TDM ordinance. The ordinance's goal is to increase the average number of people per vehicle from 1.13 in 1990 to 1.33 in 1997. This looks like a minor increase, but it can reduce the number of cars on the road noticeably. The reduction may be enough to ease rush-hour traffic significantly if it is achieved county-wide. Under CMA legislation, all cities in the County must adopt TDM ordinances.

The TDM ordinance requires employers to designate commute coordinators and to file regular reports on progress toward the TDM goal. To achieve the goal, employers may use carpool and vanpool matching, preferential parking for ridesharing vehicles, subsidies or rewards for carpools and vanpools, transit ticket sales and subsidies, shuttles to transit lines, flexible work hours, telecommuting, subsidies or rewards for bicycling and walking, and site amenities that would encourage transit use, ridesharing, bicycling, and walking. The Commuter Network, which is funded by the City, gives technical support. The ordinance will eventually apply to all work sites with 100 or more employees and to the City as an employer.

Achieving the riders-per-vehicle goal of the 1990 TDM ordinance is voluntary. The Golden Triangle cities will evaluate the effectiveness of voluntary compliance by 1995. Cities can then decide whether to make it mandatory for employers to achieve the TDM goals.

- Policy 6. Promote Transportation Demand Management programs at work sites.**
- Action 6.a** Enforce the Transportation Demand Management ordinance.
- Reporting is mandatory.
- Action 6.b** Help employers achieve Transportation Demand Management goals.

## Level of Service Descriptions

Service Level Category	Descriptions of Traffic Conditions	
	Signalized Intersections (Average Length of Wait <sup>1</sup> )	Arterials (Average Speed <sup>2</sup> )
<b>Free Flowing</b> (LOS A)	Most vehicles do not have to stop. On the average, each driver waits less than 5 seconds to get through intersection.	Vehicles can maneuver completely unimpeded and without restrictions on speed caused by other cars and delays at intersections. <i>El Camino Real at 7 a.m. on a Sunday.</i>
<b>Minimal Delays</b> (LOS B)	Some vehicles have to stop, although waits are not bothersome. Average wait at intersections is 5 to 15 seconds.	Drivers feel somewhat restricted within traffic stream and slightly delayed at intersections. Average speed is about 70 percent of free flow. <i>El Camino Real at 10 a.m. on a weekday.</i>
<b>Acceptable Delays</b> (LOS C)	Significant number of vehicles have to stop because of steady, high traffic volume. Still, many pass through without stopping. On the average, vehicles have to wait 15 to 25 seconds to get through intersection. <i>Typical LOS at major intersections during mid-day.</i>	Traffic still stable, but drivers may feel restricted in their ability to change lanes. They begin to feel the tension of traffic. Delays at intersections contribute to lower average speeds—about 50 percent of free flow. <i>El Camino Real at noon most weekdays.</i>
<b>Tolerable Delays</b> (LOS D)	Many vehicles have to stop. Drivers are aware of heavier traffic. Cars may have to wait through more than one red light. Queues begin to form, often on more than one approach. On the average, vehicle wait is 25 to 40 seconds. <i>Common afternoon peak hour LOS at many intersections.</i>	High traffic volumes and delays at intersections reduce average travel speeds to 40 percent of free flow. Drivers aware of slower pace of traffic. <i>El Camino Real at 4 p.m. at most intersections.</i>
<b>Significant Delays</b> (LOS E)	Cars may have to wait through more than one red light. Long queues form, sometimes on several approaches. Average waits of 40 to 60 seconds. <i>Apparent at major arterial intersections at peak hour.</i>	High traffic volume and many signalized intersections with long queues reduce average travel speed to one-third of free flow. <i>El Camino Real at 5 p.m. near Grant Road.</i>
<b>Excessive Delays</b> (LOS F)	<i>Intersection is jammed.</i> Many cars have to wait through more than one red light, or more than 60 seconds. Traffic may back up into "up-stream" intersections. Generally caused by obstruction or irregular occurrence (e.g., signal preemption for a train). This condition often viewed as "gridlock."	Travel is "stop and go"—one-third or one-fourth of free flow. Usually caused by a "down-stream" obstruction, such as lanes reduced from 4 to 3, or a stalled car, or signal preemption for a train. <i>At times, El Camino Real experiences LOS F where freeway Route 237 ends.</i>

<sup>1</sup> "Average wait" is a measure of traffic conditions at intersections. It is an estimate of the average delay for all vehicles entering the intersection in a defined period of time, for example, the evening peak hour. It is expressed as a range rather than a single value. Some drivers will actually wait more or less time than indicated by the range.

<sup>2</sup> "Average speed" is a measure of traffic conditions on arterials. "Average speed" is based on the total time it takes to travel a certain distance, including the time spent waiting at intersections. It is determined more by traffic volume and conditions at intersections, than by the legal speed limit.

Figure 1. Traffic Levels of Service for Signalized Intersections and Arterials.

**Action 6.c** Collaborate with other cities to evaluate the effectiveness of voluntary compliance with the Transportation Demand Management ordinance and to determine whether to make compliance mandatory by 1995.

**Action 6.d** Work with employers to develop Transportation Management Associations where appropriate.

Several employers in a geographic area may join to form a Transportation Management Association (TMA) to run commute alternative programs more cost-effectively.

**Action 6.e** Hold special events and conduct promotions to encourage bicycling, transit, and other commute alternatives in cooperation with local employers, merchants, and other organizations.

## TDM with Other Land Uses

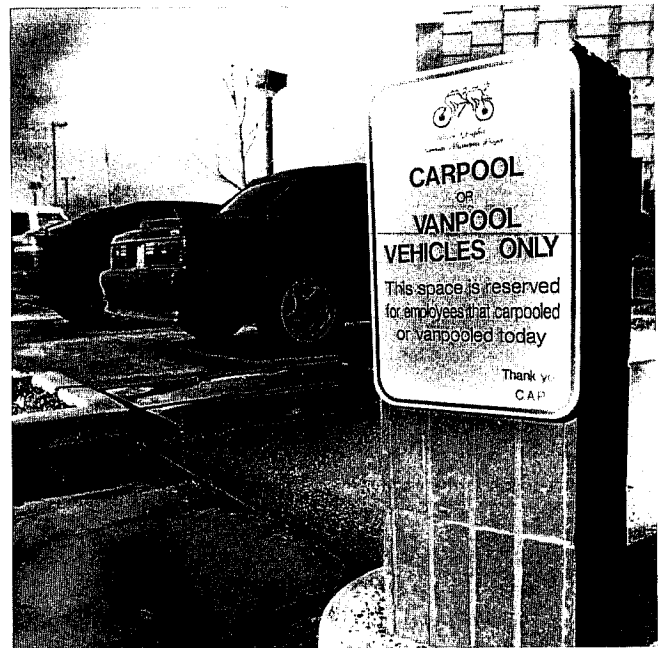
Large residential developments also have concentrations of people, some of whom can be expected to work in the same general locations. TDM programs could be set up in these developments as conditions of project approval. Developers could be required to supply funding for several years for service contracts with a nearby TMA. Or they could be required to incorporate TDM design features, such as bicycle and sidewalk connections, carpool waiting areas, and bus stops. There may also be opportunities for TDM programs at shopping centers, hospitals, schools, and other locations with large daily influxes of people.

**Policy 7. Promote TDM programs in residential developments, retail centers, and other activity centers.**

**Action 7.a** Consider requiring developers of large residential projects, retail centers, and other activity centers to prepare TDM plans, including mechanisms to ensure the TDM programs remain in effect after the project is complete.

## TDM Site-design Features

Most non-residential developments built since 1960 have been oriented toward cars. Building entries face vast parking lots. Sidewalks are lacking or circuitous. There are no lunchrooms on the site or restaurants nearby. Some fairly simple changes in the design of new development



*Preferential parking for carpools and vanpools.*

and redevelopment could encourage people to carpool, ride the train or bus, bicycle, or walk to work. They include rideshare drop-off and waiting areas, bicycle parking, preferential parking for carpools and vanpools, direct access to bus stops, bus pull-outs and shelters, showers for bicyclists, and on-site services such as lunchrooms, automated teller machines, and postal services. Parking requirements could be reduced since fewer people would be driving their cars. This would be an incentive for developers to provide these amenities.

**Policy 8. Require new development to incorporate design features that will strengthen TDM programs.**

**Action 8.a** Use the design review process to require new buildings and major additions to incorporate design features that will encourage alternatives to driving alone.

**Action 8.b** Consider establishing incentives for new developments to provide showers, cafeterias and lunchrooms, and other on-site employee services that will encourage alternatives to driving alone.

The City could consider exempting these facilities from floor area ratio limits.

**Action 8.c** Consider reducing parking requirements for new development as an incentive for strong and effective TDM programs.



# STREETS AND ROADS

The street network continues to be the basic element of the circulation system. Streets and highways are classified according to function, as shown below. Figure 2 shows Mountain View's primary street network.

The California State Department of Transportation, called Caltrans, controls the design, operation, and maintenance of freeways and highways, including traffic signals on state routes, for example, El Camino Real. Expressways are the responsibility of the County. Arterials, residential arterials, collectors, and local streets are under the jurisdiction of the City of Mountain View.



**Improve the flow of traffic on freeways and expressways serving Mountain View.**

## Highway and Expressway Congestion Relief

Freeway improvements costing \$1 billion are expected to be built with the half-cent sales tax approved by County voters in 1984 as Measure A. The tax ends in 1994. State and federal funds will also be spent. All State highways in the County were to receive major improvements. By 1991, additional commuter lanes, reserved for carpools, vanpools, buses, and motorcycles, had been built on U.S. 101 and State Route 85 from Cupertino to the Route 237 interchange in Mountain View. A new interchange at Route 237 and Middlefield and Maude Roads was also to be built in 1993. Other projects, badly needed to relieve congestion, were delayed because of insufficient funds. The first two projects listed under Action 9.a are Measure A projects that will not be built until federal, State, and other revenue sources similar to Measure A are found.

**Policy 9.** Support, where appropriate, improvements that will allow freeways and expressways to operate more efficiently.

**Action 9.a** Pursue federal, State, and other non-City funding for completion of these freeway and interchange improvements.

- Improve the U.S. 101/State Route 85 interchange, including modifying the Shoreline Boulevard and Moffett Boulevard interchanges. This section of U.S. 101 is severely congested because the interchanges for Moffett Boulevard, State Route 85, and Shoreline Boulevard are so close together.

## Street Classification System

**Freeways.** Drivers use freeways primarily for long-distance trips. Cars can enter a freeway only at an interchange; major streets cross only at underpasses or overpasses.

**Expressways.** Drivers also use expressways for regional trips. Other roads may cross expressways at intersections with traffic signals, or they may have underpasses or overpasses. It is usually not possible to enter an expressway from an adjacent parcel of land.

**Arterial.** Drivers use these streets to travel to activity centers, freeways, expressways, and other arterials. Driveways connect adjacent land uses directly; collector streets conduct traffic to the arterials.

**Residential Arterials.** Drivers reach adjacent residential areas on these streets, which pass through and immediately serve adjacent residential land uses. These roadways generally have more landscaping and less paving than non-residential arterials.

**Collectors.** Drivers use these streets to travel within and between neighborhoods and to get directly to adjacent land uses. These streets collect traffic from local streets and route it to arterials.

**Local Streets.** Drivers travel on these streets only to reach adjacent land uses. Local streets are designed to protect residents from through traffic.



*Shoreline Boulevard/U.S. 101 overpass under construction.*

- Widen State Route 85 to six lanes with commuter lanes between Route 237 and U.S. 101. State Route 85 was widened with commuter lanes from Cupertino to State Route 237 in Mountain View in the late 1980s. This project would complete the commuter lanes on State Route 85.
- Improve the State Routes 237/85 interchange. This project would improve freeway connections but could have adverse effects on the

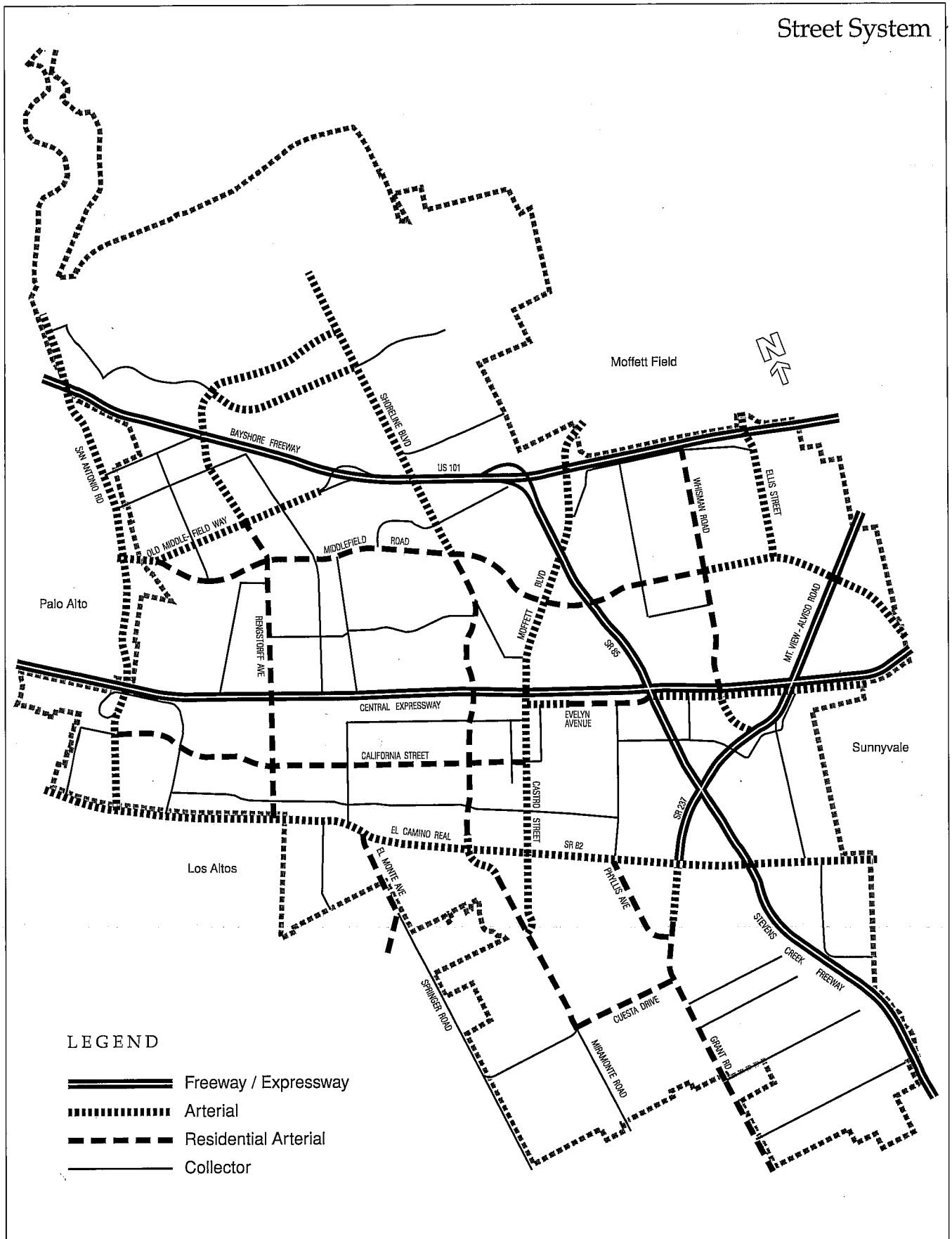


Figure 2. Local and Regional Roadway Network.

surrounding community and the planned Stevens Creek Trail. These effects must be carefully evaluated before proceeding.

- Construct direct ramp connections between Central Expressway and State Route 85. Southbound traffic must use local streets through the Downtown because there are no direct ramp connections.

## More Efficient Road Systems

Even with these improvements, drivers will be delayed excessively during rush hours by 2005 on some freeways, including State Route 237 north of El Camino Real, State Route 85 south of El Camino Real, and U.S. 101 from San Antonio Road to State Route 85. However, the highway system will have reached the limit of what can be built within available rights of way and at reasonable cost. Expanding the highway system hurts the environment because it increases noise, worsens air quality, and wastes energy. In the future, highway improvements must focus on improving the operation of the existing system. Commuter lanes are a prime example of this.

Commuter lanes can save time for people using them, increase the capacity of an overburdened system, and reduce air pollution and energy use with much of the flexibility that makes cars the preferred mode of travel. Commuter lanes can also help express buses compete with single-occupant cars for quick travel. Better connections are needed at freeway interchanges and at freeway access points to complete the commuter-lane network. Freeway ramp bypass lanes would allow high-occupancy vehicles to enter commuter lanes directly by bypassing ramp metering lights and other traffic.

**Action 9.b** Seek to have State and County agencies provide commuter lanes, ramp metering, signal coordination, and incident warning systems on freeways and expressways.

Signal coordination improves the flow of traffic on expressways and arterials where there are many traffic signals. Freeway incident warning systems use video cameras or electronic detectors to monitor the flow of freeway traffic. Traffic condition information is flashed on changeable message signs so drivers can decide whether to endure the delay, take another route, or make the trip later.

## Local Roads System

Mountain View had the foresight to construct a good system of cross-town arterials. The roads allow traffic to flow

smoothly on most streets, even in commute periods. Traffic moves much better on Mountain View streets than on the regional road system, according to traffic studies conducted for this General Plan. Figure 3 shows Levels of Service projected for major roads in 1990 and 2005. Only Grant Road is expected to decline to LOS F. (It should be noted that the traffic model used for the General Plan is more accurate for freeways and expressways and less accurate for local roads.)



**Build and maintain a safe and efficient local street system with the aim of meeting LOS goals.**

**Local Road Improvements.** Although traffic flows well along arterials, some intersections are congested, with "significant delay" or "excessive delay." These are often the intersections of major arterials or expressways where many vehicles are turning right or left.

**Policy 10. Improve safety and traffic flow on streets and at congested intersections, where feasible.**

**Action 10.a** Consider whether improvements can be made in the existing right of way before widening or otherwise expanding streets and intersections.

**Action 10.b** Decide if there are cost-effective improvements such as new traffic signals, improved signal timing, signal coordination, pavement markings, turn lanes, island modifications, realignment, improved sight distances, or construction of urban interchanges that can be made at the following intersections:

- El Camino Real with Grant Road/Route 237, with Clark Avenue, and with San Antonio Road.
- Shoreline Boulevard with Pear Avenue/theater driveway, with L'Avenida, with Middlefield Road, and with Montecito Avenue.
- Grant Road and Levin Avenue/Covington Road.
- Ellis Street and U.S. 101 on-ramps.

**Action 10.c** Improve Evelyn Avenue between Castro Street and Bernardo Avenue.

Evelyn Avenue is a major entry to Downtown Mountain View. The Evelyn Avenue Corridor Study recommended that it be wid-

# Traffic Levels of Service

This map illustrates the projected traffic levels of service (LOS) for various roadway sections in San Jose, comparing 1990 and 2005 conditions. The map includes major freeways (Bayshore, Central Expressway, and Santa Ana) and local roads (San Antonio, Middlefield, and others). Roadway sections are marked with black dots, and their LOS is indicated by a square box divided horizontally. The top half of the box shows the 1990 LOS, and the bottom half shows the 2005 LOS. Asterisks (\*) denote sections where the 2005 LOS is worse than the stated goal. The map also shows the locations of Moffett Field, Sunnyvale, and Los Altos.

**LEGEND**

- C** ← 1990 Level of Service
- C** ← 2005 Level of Service

LOS levels are for the roadway sections, not intersections.

\* LOS levels are worse than stated goals.

Figure 3. 1990 and 2005 Levels of Service, AM Peak Hour.

ened to four lanes from the Sunnyvale boundary to Downtown and be connected to Villa Street. This would provide a through route to Downtown and re-route traffic from neighborhood streets.

**Action 10.d** Widen Grant Road to three lanes, two of these to be southbound, and install curbs, gutters, and sidewalks between Waverly Place and Levin Avenue.

**Action 10.e** Install curbs, gutters, and sidewalks on the east side of Springer Road between the south City boundary and approximately Pilgrim Avenue.

The appearance and function of Grant Road and Springer Road (Action 10.d and Action 10.e) change as each passes through Mountain View and Los Altos because each City has its own standards for street improvement. Adding another lane and installing curbs, gutters, and sidewalks on the Mountain View side between Waverly and Levin would make Grant Road look better, make traffic flow more smoothly, and make pedestrians safer. Springer Road does not need widening, but would be safer for pedestrians if curbs, gutters, and sidewalks were installed on the Mountain View side from Sladky Avenue to approximately Pilgrim Avenue.

**Action 10.f** Study the feasibility of completing the interchange at Shoreline Boulevard and the south side of Central Expressway.

Construction of on-ramps and off-ramps from Central Expressway to South Shoreline Boulevard would improve traffic flow.

**Action 10.g** Consider prohibiting left turns during peak periods, closing medians, consolidating driveways, and making other modifications where needed to ease traffic congestion.

Mountain View can readily make the changes that involve public streets, after public review, but changes on private property (for example, private driveways) can only be made through City review of private projects.

**Action 10.h** Synchronize traffic signals on Shoreline Boulevard and Rengstorff Avenue.

Signal coordination makes traffic flow better on major arterials. It also makes drivers trying to cross the arterials wait longer.

**Railroad Crossings.** Some of Mountain View's more congested intersections are at railroad crossings. Opportunities for improvements range from overpasses and underpasses to better signals.

**Policy 11.** Ensure smooth flow of vehicles, bicycles, and pedestrians at rail crossings.

**Action 11.a** Consider an overpass or underpass to cross the railroad tracks at Rengstorff Avenue.

The improved crossing would relieve traffic congestion when a train passes through, but the overpass or underpass may be costly, take up land, and be less attractive than an intersection.

**Action 11.b** Work with appropriate agencies to improve the traffic signal preemption system at CalTrain crossings to eliminate unnecessary delay to auto traffic.

Each time a train crosses Rengstorff Avenue or Castro Street, through traffic on Central Expressway gets the green light. This causes unnecessary delays for some traffic movements. When new technology is available, the system should be modified.

## Neighborhoods Traffic Management

Even though Mountain View has a good system of cross-town arterials, drivers may be prompted by heavy traffic on some through streets to take short-cuts through residential neighborhoods. Excessive traffic and speeding cars can destroy the feeling and cohesiveness of neighborhoods. This can eventually discourage residents from spending time and effort to keep up their properties, and the neighborhood begins to deteriorate. The Old Mountain View Neighborhood has been threatened by through traffic, primarily because there are no good arterials for traffic traveling to and from Downtown. Other potential problem locations are the area between Grant and Springer Roads, and the area between Central Expressway and El Camino Real.



**Protect residential neighborhoods from excessive through traffic, where feasible.**

**Deterrents to Local Traffic.** The City should use a range of physical and program options to divert traffic or slow it down. The City should verify the size and kind of prob-



lem with a special traffic study before it carries out any of the options. Often, simple visual cues, instituted as part of an overall neighborhood design plan, will solve the problems. Visual cues do not appear to be traffic controls at all. Landscaping and other improvements tell drivers that they are entering a quiet residential place, where they should drive more slowly, be more aware of conditions along the edge of the street, and respect local pedestrian and bicycle traffic. Recognizable neighborhood entries are visual cues. Entries can be marked by short center medians or corner curb bow-outs with landscaping and signs. Short medians or tree planting pockets that extend into the parking lane narrow the perceived width of the street and can control speed. (See Figure 4.)

Where visual cues do not work, the City may consider installing speed undulations or closing the street partially or completely. Speed undulations are raised pavement, similar to speed bumps, but much wider. Physical deterrents may cause longer response time for emergency vehicles, reduce access, increase noise, and cause and increase maintenance costs, so it's important to be careful about installing them.

**Policy 12.** Work to actively discourage through traffic from using neighborhood collectors and local streets.

**Action 12.a** Develop neighborhood protection plans when traffic studies confirm that there is excessive traffic volume, speeding, or accidents.

**Action 12.b** Emphasize visual deterrents to through traffic; install physical obstacles only as a last resort.

**Action 12.c** Maintain the existing City standards for narrower widths on new or reconstructed residential streets.

The City's standard width for public residential streets is 32 to 36 feet between the curbs. Private streets, which are often allowed in townhouse developments, may be as narrow as 20 feet. The width and design of private streets are determined through site review.

**Arterials on the Perimeters of Neighborhoods.** Most neighborhoods built in Mountain View after World War II are not threatened by through traffic. Drivers find that nearby arterials are faster and more direct than the circuitous internal road systems of modern subdivisions. Through traffic is more of a problem in older neighborhoods where streets were laid out in a grid and the distinction between arterials and local streets is not clear. The

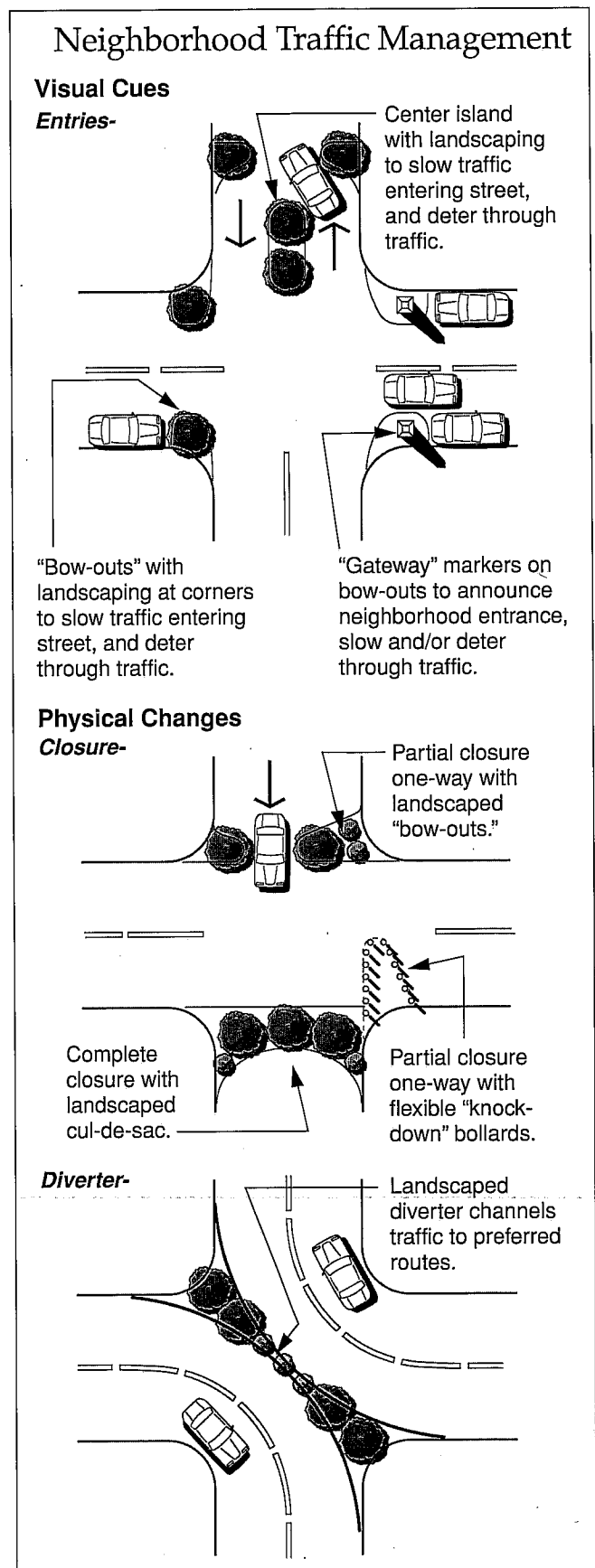


Figure 4. Traffic Control Methods in Residential Neighborhoods.

planned improvements to Evelyn Avenue will clarify its role as the preferred route for through traffic east of Downtown.

**Policy 13.** Route through traffic around the perimeters of neighborhoods where possible.

**Action 13.a** Identify arterials clearly by using design, signs, and other markers.

An example is the sign on Shoreline Boulevard directing traffic to Castro Street by way of California Street.

## RAIL TRANSIT

The Southern Pacific Railroad has served Mountain View with its San Francisco Peninsula passenger line since 1864. That service is entering a period of significant change under new public ownership. An even more dramatic improvement in rail service is planned for Mountain View with the planned extension of the County's Light Rail Transit service to Downtown.

G O A L

**G**

**Improve rail transit serving Mountain View.**

### Peninsula Commute Service

The Southern Pacific Railroad historically has stopped in Mountain View at the Mountain View Station near Castro Street and the Castro Station near Rengstorff Avenue. Caltrans took over passenger operations in 1980. A Joint Powers Board, with representatives from Santa Clara, San Mateo, and San Francisco Counties, was formed to plan for the long-term preservation and enhancement of commuter service. The service was re-named CalTrain. Caltrans purchased new rail cars, bought and rehabilitated stations, and began upgrading track. Caltrans and the three Counties subsidize passenger fares. Ridership has shown a steady annual increase since 1986. In 1990, there were 52 trains each weekday, and almost 7 million passengers annually. Two more trains were added in 1991.

In 1991, the Joint Powers Board purchased the right of way from the Southern Pacific Railroad, with a major part of the funding supplied under the 1990 Clean Air and Transportation Improvement Act. Caltrans transferred management of CalTrain to the Joint Powers Board in 1992. The number of daily trains was increased to 60, and service was extended to Gilroy. Up to 90 trains will be needed if rail service is also extended to Downtown San Francisco because many more people will choose to



*CalTrain stopping at Downtown Mountain View train station.*

take the train. The service now ends in San Francisco at the 4th and Townsend station, several long blocks south of the city's main business area. The San Francisco extension will be very expensive, and funding sources have not been fully identified.

**Policy 14.** Give strong support to plans to increase CalTrain service frequency and hours of service.

**Action 14.a.** Give active support to plans to increase the number of Peninsula commuter trains.

**Action 14.b** Work with appropriate agencies to improve train service in off-peak periods, and on weekends and holidays.

**Action 14.c** Give active support to plans to extend CalTrain service into south Santa Clara County.

**Action 14.d** Participate in evaluating the costs and benefits of extending CalTrain into downtown San Francisco.

**Stations.** As of 1992, the Downtown Station on Evelyn Avenue just east of Castro Street is an unattractive concrete block shelter and a barren parking lot. The General Plan proposes to replace this with a modern transportation center which this major entry to Downtown Mountain View deserves. The station would be a transfer point for CalTrain, Light Rail Transit, and bus passengers. Opportunities to incorporate offices, retail, and other uses into the station redevelopment plan should be explored.

Mountain View's other station, the Castro Station near Rengstorff Avenue, is to be moved to San Antonio Road where it will serve a larger population and where parking will be available.

**Policy 15. Improve the design and function of Mountain View's CalTrain stations.**

**Action 15.a** Work with appropriate agencies, and possibly a private developer, to replace the Mountain View station with a modern, attractive transportation center which could also include retail, office, or other uses.

This station design should be compatible with the Downtown street improvements, the Evelyn Avenue Corridor Plan, and the Downtown Precise Plan.

**Action 15.b** Work with appropriate agencies to relocate the Castro Station to San Antonio Road.

**Action 15.c** Evaluate the feasibility of retaining the Castro name for either the train station at Castro Street or the new San Antonio stop, when the present Castro Station is closed.

The Castro Station was named for the Castro family, which gave Southern Pacific Railroad the right to cross family lands more than 130

years ago through what would become Mountain View. The name, Castro Station, is an important part of Mountain View's heritage.

## Light Rail Transit

The County Transit District began running Light Rail Transit (LRT) along the Guadalupe Corridor as the first leg of a planned larger system in 1987. There are now 21 miles of track extending from northern Santa Clara to southern San Jose. In 1991, the County decided to build an LRT extension into Downtown Mountain View. It is called the Tasman LRT because part of its alignment outside Mountain View would follow a street by that name. It would carry up to 30,000 passengers daily between residential areas in Milpitas and eastern San Jose and employment centers in Santa Clara, Sunnyvale, and Mountain View.

Five stations will be located in or near Mountain View, serving Moffett Field, the Ellis/Middlefield industrial area, and Downtown. (See Figure 5.) The General Plan

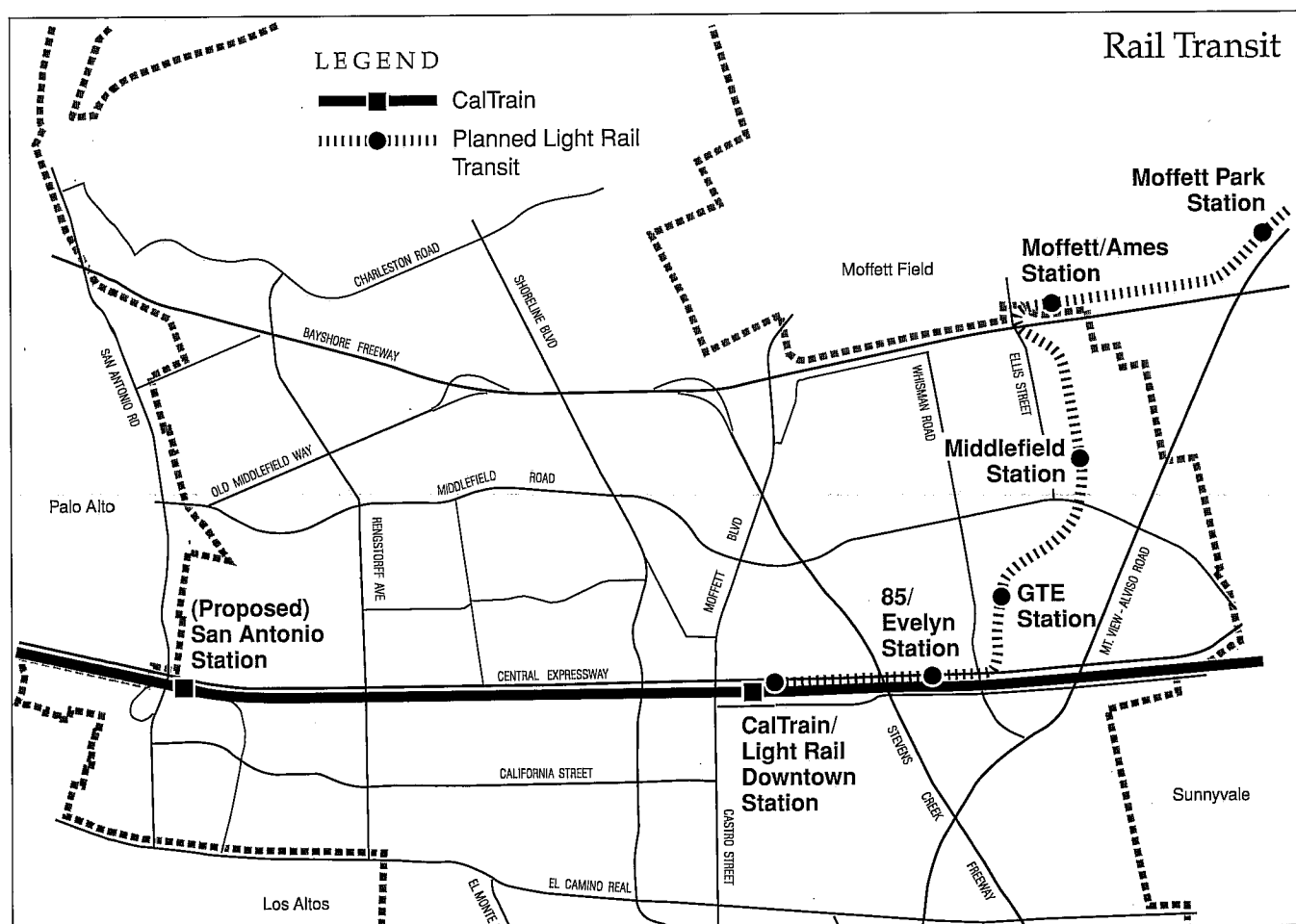


Figure 5. Rail Transit in Mountain View.



*Coming to Mountain View in the 1990s—Light Rail Transit.*

proposes high density residential and mixed-use development around several of the proposed stations. There is more information on land use and station development in the Community Development Chapter.

**Policy 16.** Participate actively with the County Transportation Agency in planning and carrying out the Light Rail Transit extension into Downtown Mountain View.

**Action 16.a** Work with the County Transit District to acquire the right of way and to plan, design, and construct the Light Rail Transit extension.

Much of the proposed alignment within Mountain View uses existing railroad right of way. The remaining right of way is privately owned.

**Action 16.b** Support plans to extend Light Rail Transit service throughout the county.

Santa Clara County has developed a long-range Rail Master Plan, which calls for an extensive county-wide LRT system.

## Access to Rail

If travelers are going to choose CalTrain or Light Rail Transit over their own cars, they must know that they can get to rail stations easily and travel to their destination with little waiting. New rail stations will attract additional traffic, so consideration must be given to how the traffic can be directed around nearby residential areas, such as the Old Mountain View Neighborhood. Parking must be readily available for cars and bicycles, and County transit bus schedules should be carefully coordinated with

train arrival and departure times. Some bus routes may need to be changed to improve access to rail stations.

Shuttle buses often connect train stations and work places most directly. Several private companies already run their own shuttles for their employees. Cooperative shuttles, subsidized by CalTrain, the City, and employers serve the North Bayshore area and the Whisman industrial area. Shuttle buses should also be available for LRT passengers.

**Policy 17.** Seek to improve access to rail transit in Mountain View.

**Action 17.a** Continue to work with employers on planning and running shuttle service between train stations and major employment centers.

**Action 17.b** Work with the County Transit District to schedule convenient train and bus connections at new and existing stations.

**Action 17.c** Make sure there is adequate auto parking at rail stations.

**Action 17.d** Work with appropriate agencies to provide adequate bicycle and pedestrian facilities at train stations.

## Safety

Improved rail service will greatly benefit Mountain View and the region. However, the City must be prepared for a greater potential for safety problems at railroad crossings, both on the CalTrain line and on the proposed LRT line.

**Policy 18.** Ensure that new Light Rail Transit and expanded CalTrain service operate safely within Mountain View.

**Action 18.a** Work with the County Transit District to incorporate safe rail crossings into the design of the proposed Light Rail Transit line, including the crossing at Ellis Avenue near the U.S. 101 interchange and the crossing of Central Expressway east of Castro Street.

**Action 18.b** Monitor safety conditions at rail crossings and train stations as the number of trains increases, and seek to develop proposals to have safety problems corrected promptly.

**Action 18.c** Provide adequate, safe waiting areas for bicyclists and pedestrians at railroad crossings.

## BUS TRANSIT

Bus service is essential to the circulation system. It is indispensable for the elderly, school children, the disabled, and others who cannot drive or choose not to. It is also becoming an increasingly attractive alternative for those who want to avoid the cost, stress, and delays of driving and the nuisance of parking. Buses can use commuter lanes on freeways, making them faster than single-passenger cars.

### GOAL



**Provide fast, convenient, comprehensive, and dependable bus service in Mountain View.**

### Bus Service

The County Transit District provides bus service to Mountain View. In 1991, 17 of the District's 80 routes served the city (see Figure 6). The basic grid system uses major arterials such as El Camino Real and Middlefield Road. Feeder routes serve neighborhoods, shopping centers, hospitals, industrial and office areas, schools, train stations, and other activity centers. County Transit buses generally run every 10 to 30 minutes on weekdays and every 15 to 60 minutes in the evening and on weekends and holidays.

In addition to its basic service, the County Transit District operates express bus service during peak commute periods. The express routes connect residential areas with employment centers in corridors where there are enough riders to justify the added cost.

Bus ridership has climbed steadily since service began in 1973. In 1991, it reached 41.6 million passenger trips, six times as many as in 1973.

The Mountain View Transit Center, located on Showers Drive between El Camino Real and California Street, is a transfer point for 12 bus lines. The Downtown train station is a transfer point for nine bus routes.

**Policy 19. Seek to have the County Transit District provide bus service and bus stops wherever there is a demonstrated need in the city.**

**Action 19.a** Seek changes to bus routes and schedules when needed to serve riders better.

Much of the City's role in improving bus service is to serve as a liaison between residents who use the buses and the County Transit District.

**Action 19.b** Work with the County Transit District and potential riders to increase express bus service to major employment centers during commute hours.

Because of limited resources, the County's Commute Service Plan for 2000 provides for only one express bus route to Mountain View. This route would serve the Whisman industrial area. Strong Transportation Demand Management programs could result in enough riders to justify the need for express routes to other areas. For example, the North Bayshore area should be served.

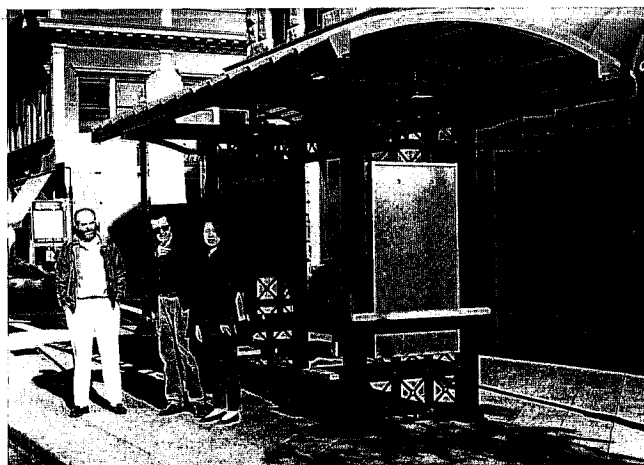
### Bus Stops

Most bus stops in Mountain View have benches and are marked with signs. Bus stops that are heavily used may have shelters. Benches and shelters should be placed where they do not block pedestrian traffic and where they are not too close to traffic lanes.

The County Transit District has a standard design for its shelters. While the standard design is quite acceptable in most locations, special designs should be considered where they can help carry out the broader design theme of an area or a new development. The Castro Street bus shelters are a good example. The proposed new transportation center to replace the Mountain View train station is another. The County Transit District does not maintain shelters designed and installed by others.

**Policy 20. Ensure attractive, well-lighted, comfortable, and protected waiting areas for bus and train passengers.**

**Action 20.a** Review bus shelter designs and plans for installing shelters in specific locations.



*Specially designed bus shelters on Castro Street.*



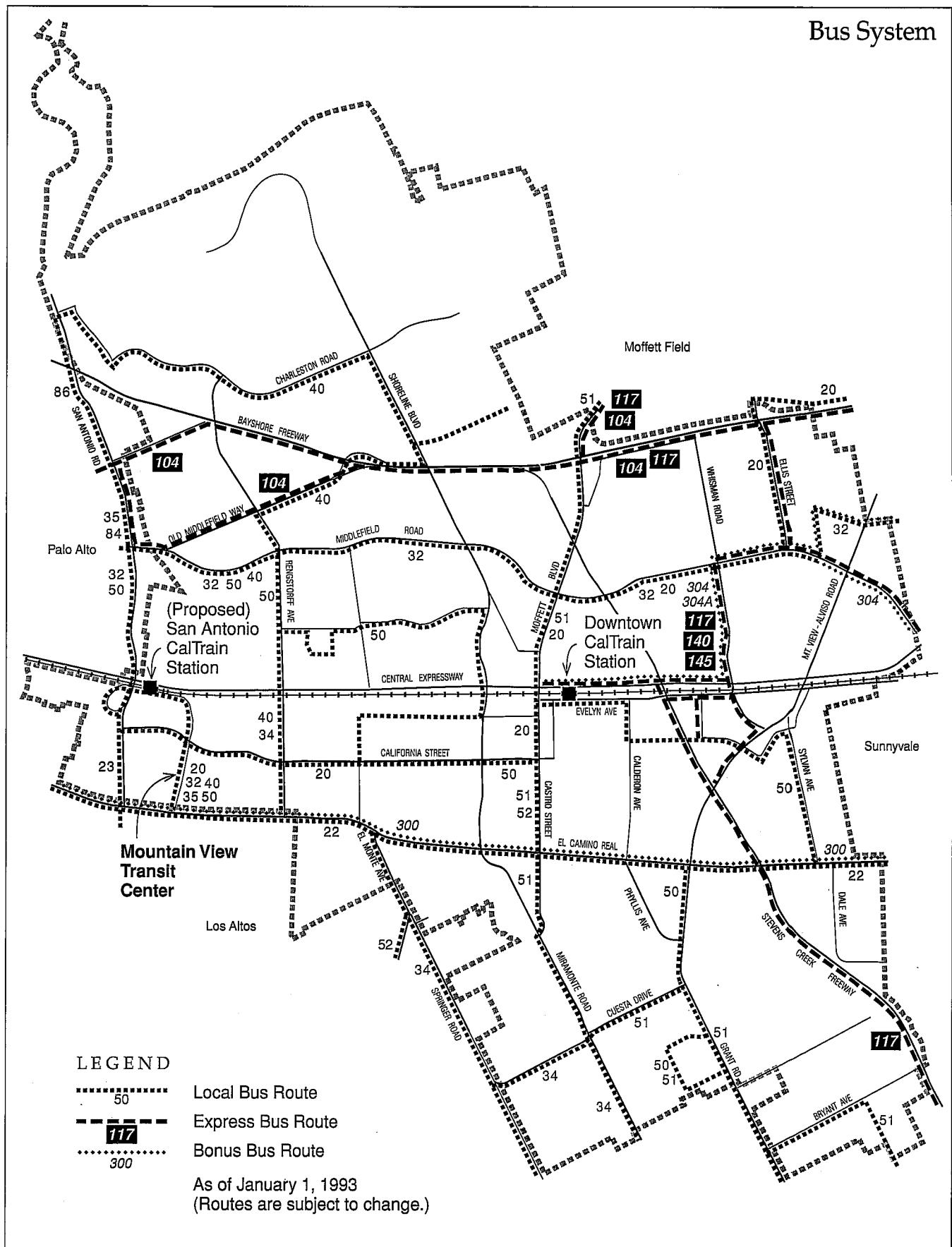


Figure 6. Local Bus Routes.

If the County changes its standard design, the City should participate in the review. The City should also review new bus stops to make sure they are compatible with adjacent uses, especially in residential areas.

**Action 20.b** Support special designs for bus shelters when they will help carry out a broader design plan in new public and private development.

**Action 20.c** Identify locations where bus shelters are needed based on use and available space, and request the County Transit District to install the shelters.

## Busing for School Children

Although many children are within walking or bicycling distance of their neighborhood schools, others need to be driven because of distance or traffic hazards. In recent years, school busing has been reduced or eliminated because of lack of school funding. The result is more traffic during the morning commute, greater energy consumption, and increased air pollution. The County Transit District meets a small portion of the student transportation need with extra runs on some routes during the school year.

**Policy 21. Encourage the elementary school districts to provide busing for their students.**

**Action 21.a** Monitor elementary school district busing plans.

**Action 21.b** Communicate the City's policy (Policy 21) to the elementary school districts when decisions on busing are under consideration.

## BICYCLE SYSTEM

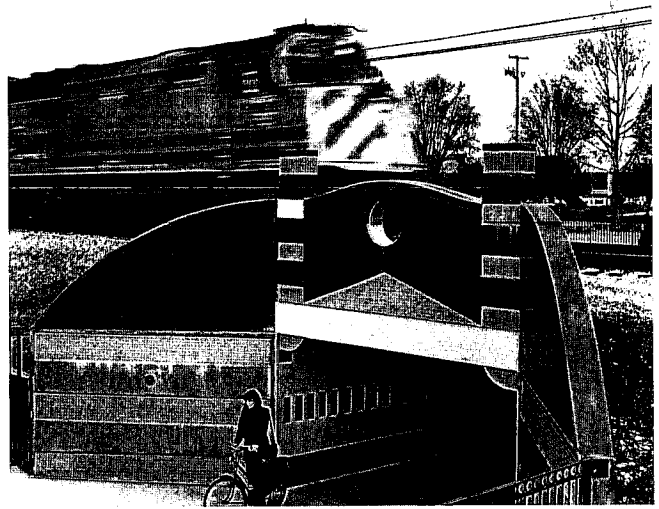
Until about 20 years ago, people rode bicycles mainly for recreation. Today, people are more concerned about physical fitness and the environment, so bicycling is a key element of the transportation system.

### GOAL

**Make it easier and safer for people to travel by bicycle.**

### A Comprehensive System

Mountain View has an extensive system of bikeways, most of them on streets. The City expanded the system from 20 to 40 miles of roadways after it was evaluated



*Bicycle/pedestrian underpass near San Antonio Road.*

by an Ad Hoc Bikeway Committee in 1986. The committee's recommendations will have been carried out fully once bike lanes are installed on remaining sections of Rengstorff Avenue and on Shoreline Boulevard. These lanes were delayed until freeway overpasses could be widened. More improvements are identified in this General Plan (see Figure 7).

Most bikeways in Mountain View are either bike lanes or bike routes, both of which are on the streets (see Figure 7). As of 1991, the only off-street bike paths are at Shoreline at Mountain View, the regional recreation and wildlife area; and along Stevens Creek in the North Bayshore area. The Environmental Management Chapter proposes that the City develop off-street bike paths in the Stevens Creek Corridor, on the Hetch Hetchy right of way, and on the abandoned Southern Pacific spur line in the Whisman industrial area. The spur line path could be developed in conjunction with the Tasman LRT. These paths will permit riders to enjoy safe, relaxing bicycling in an environment free from traffic, noise, and engine exhaust.

Mountain View is crossed by three freeways, an expressway, and a set of railroad tracks, all formidable physical barriers to bicyclists. Shopping centers and other large developments may also present obstacles. Bicycle bridges, underpasses, and designated routes through large developments offer alternatives to long detours. The bicycle/pedestrian underpass under the railroad tracks near San Antonio Road is a good example. Figure 7 shows several other locations where bridges or undercrossings should be considered.

Traffic signals that respond to bicyclists when they ride over detectors in the pavement and buttons that people can push to cross the street also help to make the bicycle system safe and convenient, as do well-maintained pavement and landscaping along bikeways.

**Policy 22.** Provide and maintain a safe and comprehensive bicycle system that connects all parts of the city.

**Action 22.a** Complete the bicycle system as shown on Figure 7.

**Action 22.b** Locate and design bikeways that are separate from streets wherever possible. Designate on-street bike lanes or routes where off-road bike paths are not possible.

**Action 22.c** Consider building bridges or undercrossings for bicyclists and pedestrians at locations shown on Figure 7.

**Action 22.d** Incorporate bicycle facilities into the design of interchanges, intersections, and other street improvement projects.

Street improvement projects should be viewed as an opportunity to enhance the bicycle system.

**Action 22.e** Develop bike paths in the Stevens Creek corridor and on the Hetch Hetchy right of way; develop bike paths in rail corridors if feasible.

The Urban Trails section of the Environmental Management Chapter discusses these plans.

**Action 22.f** Establish a bicycle advisory committee to review the bicycle system and advise staff and the City Council on needed improvements.

Bicyclists are the best source of information about where improvements to the bicycle system are needed. A bicycle advisory committee can recommend improvements and help develop proposals for State and federal funding of bicycle projects. The City gets State Transportation Development Act bicycle funds annually.

**Action 22.g** Make improvements to roads, signs, and traffic signals as needed to improve bicycle travel.

**Action 22.h** Keep bikeways free of overhanging shrubbery and other obstacles.

**Action 22.i** Regularly sweep bikeways to remove debris, which can damage tires.

**Bicycle Parking.** Easily accessible and well-designed bicycle parking can encourage people to ride their bicycles to work, shopping, school, and community facilities. Bi-

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### Bikeway Classification System

Bikeway is the general term for any marked bicycle facility. The Caltrans Highway Design Manual designates three types of bikeways. Each has standards for width, signs, and pavement marking.

**Bike Path** (Class I) Bicycles travel on a right of way completely separated from any street or highway. Example: Shoreline at Mountain View.

**Bike Lane** (Class II) Bicycles travel in a one-way striped lane on a street or expressway. Example: Shoreline Boulevard between El Camino Real and Central Expressway.

**Bike Route** (Class III) Bicycles share the road with pedestrians and motor vehicle traffic. Bike routes are marked only by signs. Example: Latham Street.

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cycle racks and lockers protect bicycles from theft and bad weather. They also clearly define where bicycles should be parked so they won't impede pedestrians or damage trees and other stationary objects put into service as bike racks. Established bicycle parking also reinforces the image that bicycles are a socially approved way to travel.

**Policy 23.** Ensure that there is secure bicycle parking at centers of public and private activity.

**Action 23.a** Require new development to provide secure bicycle parking.

The Zoning Ordinance requires new development, as a condition of approval, to provide bicycle parking equal to five percent of the total auto parking required. The ordinance also specifies which bike rack and locker designs are acceptable. Longer-term users, such as office workers, may prefer lockers because they provide both security and protection from the elements. Shorter-term users, such as shoppers, may prefer simply designed racks that are convenient to use. The ordinance should be revised to recognize the varying demands for bicycle parking.

**Action 23.b** Install bicycle parking in Downtown Mountain View and at city parks, civic buildings, and other community facilities.

**Action 23.c** Encourage shopping centers and businesses to install bike racks.

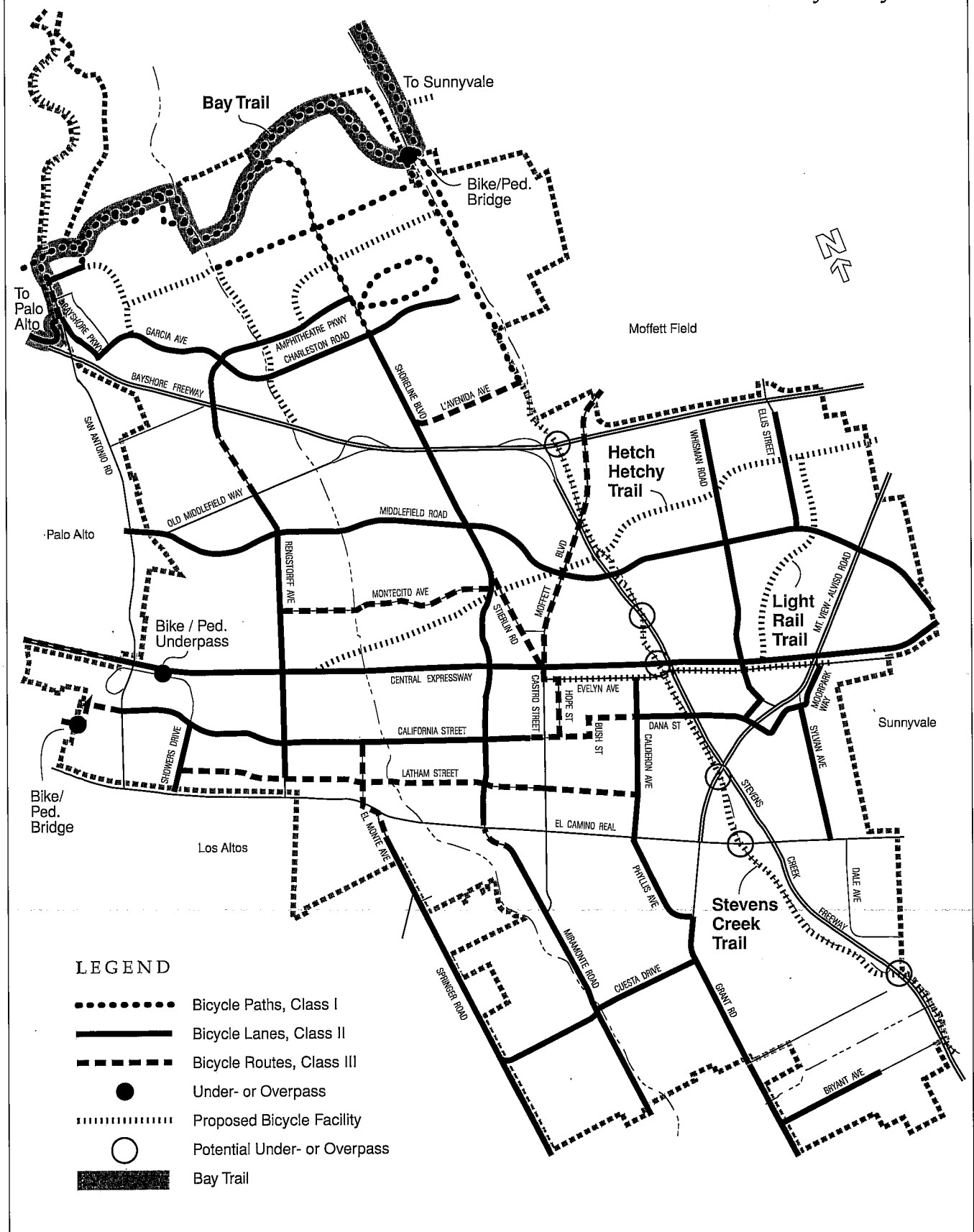


Figure 7. Existing and Proposed Bicycle Facilities.

**Bicycles on Transit.** Combining bicycles and transit enhances both modes of travel. Bicycles are a convenient and inexpensive way for people to get to transit stops. The County Transit District allows bicycles on buses when there is enough room. Similar arrangements are needed on trains.

**Policy 24. Support arrangements for allowing bicycles on trains and buses.**

**Promoting Bicycling.** Bicycling can become a part of almost everyone's life, either as a recreational pursuit reserved for weekends, or as a daily means of commuting to work.

**Policy 25. Actively promote bicycling and bicycle safety.**

**Action 25.a** Distribute maps of Mountain View's bicycle system and other information about bicycle safety through newspapers and other publications, at City buildings and schools, and at street fairs and special events.

**Action 25.b** Continue and expand the Police Department's bicycle education program.

School resource officers visit schools to teach children about bicycle safety. This educational program should be expanded to serve other groups.

## WALKWAYS

Like bicycling, walking has become more popular as a form of recreation, exercise, and even commuting. Mountain View's climate is mild and its land is flat, so people find walking to be a pleasant experience when they have clearly defined walkways and feel safe using them. The City should encourage walking along streets, within private developments, and on the urban trails planned for the Stevens Creek, Hetch Hetchy, and railroad rights of way. Urban trails are discussed in the Environmental Management Chapter.



**Make it easier, safer, and more enjoyable for people to move around the city on foot.**

### Sidewalks

Most streets in Mountain View have sidewalks on both sides, consistent with long-standing City policy. Many of the streets that do not were built under County regula-

tions before being annexed to Mountain View. There are also short, but critical, gaps in sidewalks. It is important to make sure sidewalks are continuous. The 1982 General Plan proposed to bring all streets up to current standards through City and property-owner financing on a fair-share basis. However, some neighborhoods have opposed forming assessment districts for this purpose. While the City should continue to try to complete its walkway system, it may be more productive to focus resources on arterial and collector streets where traffic is heavy and pedestrians are more vulnerable.

**Policy 26. Provide a continuous system of sidewalks along streets.**

**Action 26.a** Require sidewalks on both sides of public streets in all new developments.

**Action 26.b** Work with neighborhoods to decide where curbs, gutters, and sidewalks are needed on unimproved local streets and how to pay for the improvements.

**Action 26.c** Install and maintain temporary sidewalks or paths on at least one side of all unimproved arterial and collector streets.

**Action 26.d** Continue to replace sidewalks that have deteriorated.

The City makes temporary repairs to hazardous sidewalk surfaces as soon as problems are reported. The costs of permanent repairs may be the responsibility of the City or the property owner, depending on where the problem is and what caused it. A comprehensive sidewalk repair policy was being drafted in 1992.

### Site Design

Carefully placed buildings and well-planned walkways can encourage people to walk within large developments. For example, clustering buildings around a core reduces the distances between buildings. People should not have to walk a long way from building entries to transit stops. They should not have to share walkways with bicyclists and cars. In some large developments, it is also important to build walkways through the site to connect public sidewalks. Landscaping, shade trees, benches, and lighting can make it more pleasant to walk.

**Policy 27. Ensure that pedestrian paths are included within major new developments and public facilities.**

**Action 27.a** Require new developments to build clearly



identified internal walkways that are distinct from roadways and that directly connect building entrances to public sidewalks and transit stops.

## Encouraging Walking

Pedestrians, especially seniors and adults with small children, should feel safe and secure from traffic if walking is to be encouraged. Sidewalk widths, signal timing, intersection configuration, and proximity to heavy traffic all need to be considered. Vehicles will still need priority in some situations because of their sheer numbers and the need to reduce congestion. However, the City needs to make other accommodations where there is substantial pedestrian traffic it wants to encourage. For example, traffic signals can be adjusted to give pedestrians more time to cross the street than the minimum standard established by the State. Intersections can be designed with tight right turns to force traffic to slow down. There should be ramps at intersections for wheelchairs, baby carriages, and other non-motorized vehicles.

**Policy 28. Provide for safe walkways and pedestrian crossings of arterial streets, railroad tracks, creeks, and other physical barriers.**

**Action 28.a** Ensure that sidewalks are kept free of obstructions, such as signs and driveways, and that they are wide enough to accommodate pedestrians easily.

To provide a continuous level surface for pedestrians, the City requires new or reconstructed sidewalks to be separated from the curb.

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### How Do Pedestrian Signals Work?

Many intersections in Mountain View that have traffic signals also have pedestrian push buttons. Pressing the button triggers the “walk” signal. The signals are timed so that pedestrians who start walking at a reasonable speed as soon as the light changes have enough “green” time to cross all lanes of traffic. The duration of the “walk” signal is determined by the width of the street. Although the light begins flashing “don’t walk” about the time the pedestrian is halfway across the street, it is safe to continue walking. It is not safe to begin crossing the street at that time. At many intersections on El Camino Real, signals are timed to remain in the “walk” phase for 10 seconds and in the “don’t walk” phase for another 10 seconds, giving the pedestrian 20 seconds to cross the street safely.

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**Action 28.b** Identify locations where there is substantial pedestrian traffic and improve traffic controls and lighting that benefit pedestrians.

**Action 28.c** Avoid placing travel lanes right next to sidewalks when considering plans to widen streets.

A landscaped strip provides the best protection for pedestrians (see Community Development Action 13.a, page 22), but even parked cars and bicycle lanes can serve as buffers.

**Action 28.d** Continue to work with the school districts to provide safe crossings for school children.

**Castro Street.** Creating an active and attractive environment for pedestrians was a major goal of the Downtown Precise Plan, adopted in 1988. That Plan presents the vision for Downtown as “a place to get out of the car, a place one will want instinctively to walk, rather than drive.” Wide sidewalks, street furniture, generous landscaping, and fewer traffic lanes—all features that encourage people to walk—are included in Castro Street improvements. Precise Plan standards are also aimed at encouraging people to walk. The standards allow only stores and restaurants on ground floors. They require detailed and varied building facades, entries facing the street, and other design features for private development. Requirements and guidelines vary depending on Downtown location.

**Policy 29. Maintain the pedestrian orientation of the Castro Street area.**

**Action 29.a** Carry out the development standards and design guidelines in the Downtown Precise Plan.

## TRANSPORTATION DESIGN AND THE ENVIRONMENT

Freeways, overpasses, train tracks, and bus shelters are integral parts of the urban landscape. Although they are highly visible, greater attention is often given to their function than to their appearance and environmental effects. Since 1982, Mountain View has tried to modify this emphasis. For example, many arterials and Central Expressway have been extensively landscaped. The Community Development Chapter lists actions to continue this effort. Other examples are the special bus shelters which have been built on Castro Street and the sound walls constructed along the residential sections of new freeway projects.



**Support the development and maintenance of transportation facilities that are aesthetically pleasing and have minimal adverse environmental effects.**

## **Residential Arterials**

Creating “residential arterial” streets is one technique that Mountain View has used to improve the appearance of roads and integrate them better into the community. These are arterials that pass through residential neighborhoods. They carry traffic in the same way as other arterials, but the City emphasizes design elements that screen sidewalks and front yards from the sights and sounds of heavy traffic, slow the speed of vehicles, narrow the streets physically, and make them look narrower. These elements include:

- Reducing curb-to-curb pavement width.
- Retaining more narrow widths where safety allows.
- Designing streets so they have planter strips between street and sidewalk.
- Screening cars parked at the curb from residences.
- Planting larger trees closer together between curb and sidewalk.

Much of Middlefield and Grant Roads and sections of Shoreline Boulevard, Rengstorff Avenue, California Street, Phyllis Avenue, and Cuesta Drive have been upgraded to residential arterial standards, but other roads need attention.

**Policy 30. Enhance the character of arterials in residential neighborhoods with landscaping and special design elements.**

**Action 30.a** Prepare design plans for and improve the residential arterials that have not yet been upgraded:

- Whisman Road from Middlefield Road to U.S. 101.
- Miramonte Avenue.
- El Monte Avenue/Springer Road.
- Rengstorff Avenue from California Street to Middlefield Road.
- Cuesta Drive from Miramonte Avenue to Springer Road.
- Shoreline Boulevard from Central Expressway to U.S. 101.

## **Environmental Effects**

Noise and air pollution caused by transportation are a regrettable part of city life. Generous landscaping, buffers, overpasses and underpasses, sound walls, and careful design can insulate the community from some of these effects. Methods of keeping visual unattractiveness, noise, traffic, and air pollution to a minimum should be included in planning for transportation. Noise reduction measures can also be incorporated into the design and construction of new buildings as described in the Noise section of the Environmental Management Chapter.

**Policy 31. Reduce the negative effects caused by roadways and rail lines on visual quality, air quality, and noise.**

**Action 31.a** Seek to have sound walls installed along sections of freeways and expressways that pass through residential areas when the roadways are widened or otherwise improved.

**Action 31.b** Assess the visual and noise effects of proposed underpasses, overpasses, and interchanges and soften their effects on residential neighborhoods.

**Action 31.c** Review environmental impact studies for proposed transportation projects to be sure that adequate measures are taken to make the impacts of their noise, traffic, and other effects less severe.

Even highly desirable transit facilities can affect the local environment. The City should evaluate all environmental impacts and identify appropriate measures to make them less severe.

**Vehicle Design.** Great progress has been made in making cars run cleaner and get better mileage, but people are driving more, so these gains are being eroded. It looks like the private automobile will continue to be Americans’ favorite transportation method, so it is important to keep up the search for greater energy efficiency and cleaner emissions. Compressed natural gas, ethanol, and electricity are favored technologies. They need faster and safer refueling methods to help make them competitive. Vehicles powered by natural gas and electricity also need better battery and fuel storage so they can travel longer distances between refueling. Travel range is usually not a major concern for municipal vehicle fleets, so natural gas and electricity should be considered.

**Policy 32. Support State and federal legislation that promotes vehicles that use less energy and have lower emissions of air pollution.**

**Action 32.a** Investigate the feasibility of gradually changing the City's vehicle fleet to more fuel-efficient models, including models that use alternative fuels.

**Action 32.b** Encourage the County Transit District to convert to cleaner, quieter buses, using Mountain View routes to test prototypes.

The diesel-powered County Transit District buses produce offensive exhaust. The District is considering the use of alternative fuels to meet new State exhaust emission standards. Prototype buses that use alternative fuels could be tested in Mountain View.

## ACCESS FOR THE MOBILITY-IMPAIRED

An estimated 3.5 percent of the population in Santa Clara County cannot use conventional public transportation because they have a physical or mental disability. Many are elderly; others use wheelchairs or have other mobility limitations.



**Ensure that people who are mobility-impaired have access to transportation.**

### Access to Public Transit

Most County transit buses have wheelchair lifts as of 1991; all are to be wheelchair-accessible by 1993. Light Rail Transit is also wheelchair accessible, and the Joint Powers Board is studying methods of providing lifts on CalTrain cars. New rail stations are also required to be accessible. Existing stations must be made accessible within certain time frames under the federal Americans with Disabilities Act passed in 1990.

**Policy 33.** Support improved access to public transportation by people with disabilities.

**Action 33.a** Represent the needs of Mountain View residents to transit providers responsible for carrying out handicapped-access regulations.

**Action 33.b** Review the plans for new train stations and transfer centers and identify potential obstacles for people who are mobility-impaired.

## Paratransit

People who cannot use conventional, fixed-route transit need specialized services, called "paratransit." The Community Services Agency provides a paratransit service, Vantrans, to residents of Mountain View, Los Altos, and Los Altos Hills. Seniors and disabled people of any age who have no other means of transportation may use the service for a small fee. Vantrans service operates on weekdays between 8:30 a.m. and 5 p.m. by reservation. It gave more than 13,000 subsidized rides in 1990, 85 percent of them to Mountain View residents. Most trips are for medical purposes, and most riders are elderly and long-time residents.

A major share of Vantrans' budget comes from the State sales tax, with the City of Mountain View contributing about 8 percent. The demand for paratransit services is expected to increase as the population ages. The Americans with Disabilities Act is also expected to change the character of paratransit because it requires transit districts to provide paratransit service comparable to regular service.

**Policy 34** Supplement the public transit system with paratransit services for the elderly and mobility-impaired where needed.

**Action 34.a** Continue to contribute resources to Vantrans or similar paratransit service.

## Handicapped Access Regulations

The State Health and Safety Code (Title 24) and the City's Zoning Ordinance establish requirements for access to and within buildings and other facilities.

**Policy 35.** Ensure that people who are mobility-impaired can conveniently and safely move from parking lots to buildings and transportation boarding areas.

**Action 35.a** Continue to carry out requirements for handicapped parking and building access in public and private developments.

## PRIVATE TRANSPORTATION SERVICES

Although the public transit system in Santa Clara County is extensive, there are specialized transportation needs that can best be met by the private sector. These include shuttle buses serving limited routes during peak travel periods, and taxis.



*CalTrain shuttle picking up employees in the Whisman industrial area.*

## GOAL

# M

**Encourage private transportation services within Mountain View.**

### Shuttle Services

Several large employers operate shuttle buses between Caltrans stations and their buildings, as discussed in Policy 17. At least one employer runs a shuttle bus to Downtown during the noon hour, benefiting both employees and Downtown businesses. Noon-hour shuttle buses also help TDM programs by giving employees opportunities to run errands during the work day even though they may not have access to their cars.

**Policy 36. Encourage innovative methods of running shuttle or jitney services as needed within Mountain View.**

**Action 36.a** Work with employers who want to provide shuttle service from industrial and office areas to Downtown Mountain View and other shopping and entertainment districts.

**Action 36.b** Identify other potential shuttle routes.

There may be other travel corridors, for example between high-density residential areas and rail stations or shopping centers, that would benefit from shuttle services. Opportunities to run shuttles on these routes should be pursued.

### Taxicabs

Four taxi companies are licensed to serve Mountain View. Taxicabs are inspected annually and drivers must have City permits. The Police Department follows up on com-

plaints about drivers and cars. Taxi fares are higher than other forms of transportation, although the service is personalized.

**Policy 37. Encourage private taxi service in Mountain View.**

**Action 37.a** Continue to monitor taxi service in Mountain View and require improvements as needed.

**Action 37.b** Evaluate the potential role of taxi companies in providing service to people who are mobility-impaired.

Some cities subsidize taxi companies for paratransit service.

## PUBLIC INVOLVEMENT

The success of the transportation Policies and Actions proposed in this Chapter depends on public commitment. Giving residents ample opportunity to participate in developing and carrying out these Policies and Actions is the best way to get this commitment.

## GOAL

# N

**Seek public involvement in planning and carrying out transportation improvements.**

### Review of Plans and Projects

The City can involve more people in transportation planning by notifying them when major issues are being considered by the City or transportation agencies. This can be done through newspaper and television advertising and by making copies of reports readily available.

**Policy 38. Encourage regular public comment and suggestions on regional and local transportation plans and projects.**

**Action 38.a** Continue to supply clear, readily available information and to hold public meetings on proposed transportation projects and plans.

### Responsiveness to Problems

Almost everyone uses a part of the circulation system every day. Users are a prime source of information for the City and other public agencies on how the system is

functioning. Unfortunately, it is often difficult for the public to know where to report problems. Letters and phone calls to City offices and letters to *The View*, Mountain View's monthly newspaper, are good ways of communicating concerns.

**Policy 39.** Help residents communicate their concerns and suggestions about transportation facilities to the appropriate people or agencies.

**Action 39.a** Publicize the names of agencies and individuals responsible for responding to questions and concerns about traffic and transit problems.

The City Services Directory, periodically published in *The View*, is one source of information on who is responsible for specific transportation issues.

**Action 39.b** Notify the public when construction projects are about to begin on local streets, expressways, and freeways.

## BALANCED TRANSPORTATION FUNDING

Historically, the road system has received a high proportion of the financial investment in transportation. If the goals, policies, and actions in the Circulation Chapter are to succeed in getting more people to use alternative modes of transportation, it is critical that funding priorities reflect a commitment away from roads. The County's new Transportation Plan, which incorporates the major highway and rail projects planned for Mountain View, reflects a decisive change in direction. If this plan is carried out as proposed, two-thirds of the County's transportation funds will be spent on transit between 1990 and 2010.

G O A L

**O**

Ensure balanced funding for transportation systems.

**Policy 40.** Shift a greater proportion of transportation funding toward improvements related to bus, rail, bicycle, pedestrian, and carpool transportation.

**Action 40.a** Emphasize funding for alternatives to the single-passenger auto when appropriating money for transportation projects.